Use of Smartwatches for the Emotional Self-Regulation of Individuals with Autism Spectrum Disorder (ASD)

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Abstract : One of the most challenging aspects of the executive dysfunction of people with Autism Spectrum Disorders is the behavior control. This is related to a deficit in their ability to regulate, recognize and manage their own emotions. Some researchers have developed applications for tablets and smartphones to practice strategies of relaxation and emotion recognition. However, they cannot be applied to the very moment of temper outbursts, anger episodes or anxiety, since they require to carry the device, start the application and be helped by caretakers. Also, some of these systems are developed for either obsolete technologies (old versions of tablet devices, PDAs, outdated operative systems of smartphones) or specific devices (self-developed or proprietary ones) that create differentiation between the users and the rest of the individuals in their context. For this project we selected smartwatches. Focusing on emergent technologies ensures a wide lifespan of the developed products, because the derived products are intended to be available in the same moment the very technology gets popularized, not later. We also focused our research in commercial versions of smartwatches, since this way differentiation is easily avoided, so the users' abandonment rate lowers. We have developed a smartwatch system along with a smartphone authoring tool to display self-regulation strategies. These micro-prompting strategies are conformed of pictograms, animations and temporizers, and they are designed by means of the authoring tool: When both devices synchronize their data, the smartwatch holds the self-regulation strategies, which are triggered when the smartwatch sensors detect a remarkable rise of heart rate and movement. The system is being currently tested in an educational center of people with ASD of Madrid, Spain.
Keywords : assistive technologies, emotion regulation, human-computer interaction, smartwatches
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